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‘Modern’ forms of energy in the cottages and farms of Rural England, 1920–1960

Karen A Sayer, School of arts and Communication, Leeds Trinity University, Leeds, UK

Email for correspondence: k.sayer@leedstrinity.ac.uk

The modernisation of farming became a key policy issue in Britain after the Second World War, and the (more) efficient use of energy was seen as key to that process because of labour shortages. Traditionally, farms had been organized to make the best use of energy around the farm, be that energy human, animal or mechanical, or (latterly) derived from off-farm fuels. The apparent crisis in the availability of human labour therefore led to propositions that labourers be encouraged to stay on the land, by improvements to housing and rural infrastructure, and that farms use new forms of energy particularly electricity. Analysis of a range of sources such as autobiographies, advertising literature, films, advisory texts, cash books and social survey data, shows that, despite the political rhetoric, there was a high degree of continuity in energy consumption, however, that this was multiform and that change was far from linear, even as a range of fuels (paraffin, calor gas, petrol, diesel, TiVO), all selling themselves as ‘Modern’, came into use. Analysis shows that there were multiple, overlapping and sometimes competing, rural ‘modernities’ in Britain 1920-1960.

Keywords: modernity, energy, farm, agriculture, electricity

Steam, gas, and oil engines are now extensively used on the farm, and petrol motors have recently been introduced with some degree of success for land cultivation, and for driving threshing machines, chaff cutters, and other farm machinery.

The motive powers chiefly utilized in performing mechanical work may be divided into— (1) Animal power; (2) wind power; (3) water power; (4) steam power; (5) power derived from the explosion of gas, vapourized oil, petrol etc.; and (6) electrical power.ⁱ

(Henry Bamford, in his entry ‘Motive Power in Agriculture’ in *The Standard Cyclopedia of Modern Agriculture and Rural Economy*, (1909))

Now if hay is made it is baled and raised into the mowstead by elevator; manure is spread by tractor pulling a muck spreader, and large milking parlours with water laid on, electric milking machines and mechanical means of clearing the manure are essential. It is surprising to remember that many of these changes have only taken place since the Second World War, so that as hay time comes round nostalgia is often expressed by the older generation for the old ways of which the barns and the smell of newly-won hay were so much a part.ⁱⁱ

(M. Hartley and J. Ingilby, *Dales Memories*, (1986))

Introduction

The commonplace, nostalgia-driven, post-WWII story of British farming is that to boost productivity, cows came to be managed and milked in new stalls, pigs and hens came to live indoors, and (coal-generated mains) electricity facilitated a brave new commercial and specialised world of round-the-clock drying, heating, sterilising, hot water, rapid cooling, milking, step-lighting patterns and automation. Rural recollections written up in Britain during the 1980s, such as those embedded in Hartley and Ingilby’s *Dales Memories* (1986),

capture memories of energy transition in narratives of ‘modernisation’ to cast a softer glow over their subject.ⁱⁱⁱ Until recently, the spread of new forms of farm management and husbandry, and associated consumption of mains electricity, have been normalised as an essential part of that post-war story. But, at the very least that story both starts earlier and takes longer to bed down than this narrative usually suggests. As the epigraph shows, Henry Bamford (grounded in direct experience of farm machinery manufacturing) mentions electricity in his entry ‘Motive Power in Agriculture’ in *The Standard Cyclopedia of Modern Agriculture and Rural Economy*, (1909); then there was the passing of the statutory mechanisms necessary for the formation of a national grid in Britain via the Electricity (Supply) Act in 1926; the publication of Borlase Matthews, *Electro-farming, or, the application of electricity to agriculture*, (1928); all followed up a little over twenty years later by the 1948 nationalisation of the supply under the aegis of the British Electricity Authority. However, adoption of electricity at the level of the farm, as Paul Brassley has demonstrated,^{iv} was subsequently less than straightforward. As the current literature in agricultural history, environmental history and the history of science is therefore beginning to show, even the adoption of electricity via the grid fails to lend itself to linear narratives of ‘progress’ and ‘transformation’.^v If we read the evidence of the energy consumed around the farm, the use of mains electricity was far from being a precondition to the adoption of new ‘efficient’ forms of ‘modern’ agricultural production after the Second World War in Britain, despite the rhetoric of its apologists. And, as rural historians have demonstrated, agricultural production during this period itself gave rise to competitive alternatives all seeking what had been called ‘improvement’.^{vi} Energy consumption and ‘efficiency’ in agriculture, rather than simple linear expressions of an abstract concept ‘progress’, it will be argued, in fact remained expressions of integrated farming fitted to the local region, based on an established spatial paradigm for the use of mobile, accessible (human and animal) labour. This produced multiple rural ‘modernities’ 1920-1960.

Energy consumed in the farm and the farm yard

In the preceding period, the use of energy on the farm had come to be understood as essentially located within the (human and animal) labour immediately available in the region; other resources could and should be brought in, but only if necessary, because that was costly to the farm’s books. In the improving agricultural literature of the nineteenth century, designs for cottages and farmhouses became fundamental to the overall conception of the ‘model farm’ as a fully integrated unit of production. Farm contracts varied by region – in remoter

areas, such as Northumberland and the border, securing the regular work of hinds and ‘bondagers’, others focusing on an annual hiring of the skilled men couple with casual day or piece labour in gangs as the need arose – and reflected the pattern of production by season in that place. It was common to see essays on agricultural production include diagrams and descriptions of a homestead as part and parcel of thinking about best practice in farm management and methods, alongside farm buildings designed to house animals, store food and house equipment. When land agent George Buckland wrote up his prize essay on ‘Farming in Kent’ for the Royal Agricultural Society of England, (February 1845), he was careful to provide a diagram of what he considered the epitome of model farms as having been built from a ‘design to erect a farmery on strictly systematic principles, so that there should exist a mutual connection between all its various departments’. In the plan, laid out for Lord Torrington, all was thought through ‘with a view to economic labour and systematic details ... [such as] carrying off ... water’. That meticulous and efficient design included provision of a farmhouse and three cottages, piggeries, byres, workshops etc..^{vii}

This model, grounded in the most effective use of available energy, remained dominant and shaped thinking about the idea of ‘the farm’ well into the twentieth century. It was still applauded, for instance, in an interwar-teaching film *The Farm Factory* (1936), directed by Mary Field, in which each unit on a mixed East Anglian farm was described as having been placed carefully and efficiently to maximise output, just as in a contemporary ‘factory’. The off-screen narrator (John Morgan), explains for example how the location of workers’ living quarters was determined with an eye to overnight access by stockman to stock and by field labourers to field, headman and carter to horses. We see the men walk and cycle quickly to their jobs, the horses pulling farm equipment, cattle and pigs accessing pastures, food and water from the stockyard with ease, and a truck bringing in some supplies to an old tithe barn..^{viii}

The model – described by the 1950s through labour efficiency studies – lasted after the War, adapted to include mechanised milking machines, separators, water heaters, and the cooling and lighting of milking parlours were powered by hand, by small standing engines, by TIVO/petrol/diesel generators, or by electricity. A Pathe film of the immediate period of reconstruction after the Second World War offered an account of emerging rural modernity harnessed to the national good encapsulated by the ‘labour-saving’ and hygienic effects of electric power in contrast to all older forms of energy consumption (especially oil/paraffin lamps, and hand milking). Electricity it says would soon be boosting agricultural production

and exports, as well as food supplies at home. But, the very fact that this film was made to celebrate the coming transformation of the countryside, demonstrates that electricity was far from commonplace in rural Britain. The film also captures the laboriousness and very un-modern manual processes of installation as men work their way on foot across fields carrying and putting up wooden pylons.^{ix}

During and after the War, multiple energies were consumed even in ‘modern’ agricultural production. This necessity was recognised and accommodated by the dedicated advisory literature that underpinned the emergence of specialisation. The general *Farming Handbook* (1942) provided an image of incubators on ‘an electric poultry farm’, and information from the Electrical Development Association,^x but within the standard poultry text, of the same period, it was stated that though ‘electric lighting is the most convenient’, because ‘when it is available arrangements can be made to switch on the lights at a given time in the morning’, it was not essential. The author suggested, simply, that ‘failing electricity, acetylene or paraffin vapour lamps (mantle type) are recommended’.^{xi} This reflected the reality on the ground, hence the farmer Paul Dunn remembered that one of his childhood jobs included: ‘lighting the Tilley [paraffin] lamps for the hens on a deep litter system’ in the winter.^{xii} This heterogeneous use of energy on the farm had a long-standing history. Moreover, it is telling that in 1909 Bamford flagged animal power first energy source and went on to account, in detail:

ANIMAL POWER. -- The power of animals, working eight hours per day, in comparison with the standard horse-power of 33,000 foot-pounds per minute, is as follows: -

Horse = 22,000 foot-pounds per minute

Ox = 11,000 to 12,000 foot-pounds per minute

Mule = 10,000 foot-pounds per minute

Ass = 3,5000 foot-pounds per minute

Man, turning a crank or pumping water = 2,000 to 2,750 foot-pounds per minute^{xiii}

By focusing on a single form of power, such as (coal-fired) mains electricity, we therefore lose sight of the long-standing complexity of the energy networks in play in rural areas, including the continued use of the motive power of animals such as the horse and the Ox that were still used until the 1960s.^{xiv} So, why do we focus on it?

Electricity

Initially, efforts to introduce electricity in farming were writ large, prescriptive and advisory literature dominated descriptive accounts and have overdetermined the story so far. Attempts were made to look at the application of electricity to agriculture in every possible respect by its enthusiasts. Promotion of electricity of a form of efficient, safe power was commonplace, and it was harnessed to existing tools/equipment such as chaff cutters, silage knives, and grooming equipment. In 1945, and subsequent editions, the key textbook for all Electrical Engineers, edited by Edward Molloy discussed sources of electrical power before describing recommended electrical agricultural or horticultural appliances. These sources included steam, water and wind, and the text recognised that ‘many farms’, rather than accessing AC supplies via local generating stations (wind, hydro or steam-powered) or the mains, still relied on DC generators. Indeed, though the stated project of the section was to give farmers every help in increasing food production, considering the Hot Springs Conference in 1943, it even included adverts for Douglas petrol-driven generators.^{xv} Mains AC electricity, and the hoped-for improvements in production associated with its consumption, was therefore still recognised as novel in rural Britain after World War Two, even by its most enthusiastic proponents. When describing electricity, its generation, distribution and installation, technical terms and language were vastly simplified to make it appear as easy as possible to adopt it, e.g. voltage was described in terms of ‘pressure’, so that the lay reader could understand electricity like water being put under high pressure to be moved long distances, and then that pressure being reduced/stepped down for the local user to tap into and make use of it. The overall gist was that electricity was modern, necessary, understandable and accessible. It fitted straightforwardly into the wider context of post-WWII agricultural policy-making, and promoters drew on that context wherever possible. The narrative of simplicity as modernity/modernity as simplicity and electricity as the form of energy that worked in cases both ways became very seductive.

The absence of mains electricity in rural Britain was therefore discussed widely by policy makers and commentators and by those who sought to modernise agricultural production after the War. C. A. Cameron Brown discussing its progress in 1946, for the National Institute of Agricultural Engineering, laid the responsibility first and foremost on the farmers in the 1930s. The supply companies, he said, had sought to move out to ‘truly rural areas’ from the successes of suburban connection, but the schemes had failed because it was hard ‘to interest farmers in electricity’. He thought that farmers had become interested by 1938-39, but the War had then intervened and made equipment and labour too scarce for connection to

take place. After WWII, it was the materials that had become the main obstacle.

Nevertheless, he went on (speaking from his experience as a regular contributor on the use of electricity in agriculture to the Institute of Electrical Engineers' journal from the 1940s^{xvi}), the 'electrical industry' had been working on investigating the uses of electricity in farming via the Electrical Research Association, with aimed to (1) 'put farm electrification on a better economic basis' and (2) 'enable the farmer to enjoy the maximum operational and economic advantages from using electricity'. The key aim was to 'widen the scope of uses for electricity' so that they would spend £50 annually on it rather than £25 as was then the case. Such an increase would then make it economically worthwhile i.e. covering the cost of connection.^{xvii}

If farmers were uninterested in electricity, they had to be persuaded to use it by suppliers, so the suppliers broke down the typical tasks of agricultural production to see where they might be plugged in and double their consumption. Cameron Brown went on to describe potential farm applications, based on ERA research: grinding animal feed, soil warming and sterilising bulbs in horticulture, milk production, curing hay, drying grain. Studies like this detail incidentally the work already being done using other energies, and as he himself noted, the industry researched and disseminated the uses of electricity in agriculture, rather than agricultural organisations, because they needed to drive up demand for their own product. That demand was managed through the adoption of a special 'E.R.A. line' and recommendation that to meet demand for connection economically single- rather than three-phase lines be installed in remoter areas, with the additional advice that farmers there use small motors and adopt 'automatic methods' to spread out the work e.g. drying grain out over a period of weeks, and thus ensure reduced loads.^{xviii} The consequence was:

The farmer will be expected, on his part, to show a certain degree of accommodation to what may in many cases be somewhat drastic revision of the hitherto accepted techniques.^{xix}

This kind of account reveals the commercial drivers in energy production and consumption, and the net effect in terms of expectation: the farmer was to change their methods, not because of best agricultural practice, but to manage the energy loads for suppliers within the electrical grid. However, this paid little attention to the everyday needs of farmers or to agricultural practice. Electricity belonged in a heterogeneous context of energy consumption in the cottages and farms of rural Britain because it was not always an ideal fit for the task.

One inexperienced farmer during the Second World War, for example, found that using (battery-powered) electric wire to keep his cattle out of the kale in temporary leys (themselves a relatively new form of adaptable grazing recommended by the War Agricultural Committees) failed to consider the responses of their animals:

when the grazing is all exhausted in the early winter and cattle see the kale and roots on the other side, an electric fence does not deter them and I therefore have to add barbed wire. I told them [visiting members of the W.A.E.C.] how I have several cases of damaged udders and teats due to the cows' breaking over this barrier, and how I had lost two crops of beans, one crop of kale and one crop of marigolds and ... that unless the landlord will pay for a proper permanent fence...it is useless to try to grow any arable crops in this field while some of it has to be grazed.^{xx}

Farm animals' health, welfare and productivity could be compromised by poor use of energy. Or, rather, it could be harmed by a too hasty and unreflective adoption of new technology inserted simplistically into the managed spaces of the farm without due attention being paid to how those spaces were normally managed for the stock – the farm as a system was made up of more than just the interests of the farmer, or the market, it also included (in this case) cattle determined to use physical force to eat whatever they wanted. However, elsewhere, it was simply more practical to substitute the manual labour of employees, if that was the decision to be made, with mobile generators that used (as stated in the epigraph), 'power derived from the explosion of gas, vapourized oil, petrol etc.' and could be wheeled from task to task: a power supply that was more flexible than the mains. Hence, as Paul Brassley has argued, using the National Farm Survey data and interviews, farmers made practical choices for energy consumption based on what was available, their resources and what was considered robust.^{xxi} This was equally true in the farmhouse.

Energy consumed in the farmhouse and cottage

In addressing the consumption of energy in rural homes, we need to consider 'services' (connections to infrastructure/energy) and 'stuff' (including the goods that connect to 'services').^{xxii} In thinking about the 'stuff', items that burned oil, paraffin and bottled gas as well as electricity were used together. As we see in the epigraph, changes in the use of energy are often used in memoirs to offer the (implied) reader a sharp nostalgic contrast to both urban life and life in the rural past. In 1950 'A Norfolk Woman' recounted how in 1938 lighting 'the house would have been difficult had it not been for calor gas. ... Candles were

the only lighting in the bedrooms, and small non-topple lamps on landings and staircase'.^{xxiii} In this way, the absence of modern amenity has been used to empathetic effect in writing about the countryside. Irene Megginson, for instance, in writing *Mud on My Doorstep* (1987) described joining a farming family in Yorkshire during the war and learning to do housework with 'a lack of "mod. cons." – amenities taken for granted by most townspeople then, and almost all country folk now'.^{xxiv} This contrast with the availability of electricity and electrical devices, plus other modern amenities such as running water, which she was familiar with in comfortable middle-class Hull, seemed abnormal: the energy available from the grid in cities had come to be taken for granted to the extent that only by moving beyond the reach did the infrastructure become visible. This experience of a marked contrast between urban and rural life was widespread and continued after the War, in the South as well as the North of England. Testimony suggests, for example, that nineteenth-century brick-built labourer's cottages in East Anglia, though constructed in new machine-made materials, were nevertheless still unconnected to mains sewage, water or electricity in the 1950s.^{xxv} Similarly, Colin Miller in *Country Boy*, mentions 'a number of houses 'up the heath' and in the neighbouring village of Fleggburgh ... [that] were still illuminated by paraffin lamps well into the 1950s'.^{xxvi} A farmhouse or a cottage could be perfectly 'modern' for its time in its structure, yet seem to lag^{xxvii} in its services and stuff from the point of view of anyone convinced of a direct equivalence between modernity and specific forms of energy, and of paraffin lamps equating to the oil lamps of the Georgians. But, more significantly, when we look at the consumption of energy the story becomes yet more complex: where the site of the cottage was essentially connected to the farm, the labourer's daily work was still an element of the farm's available power.

Within the dominant agricultural paradigm, both farmhouses and labourer's cottages were thought of as integral elements of the British farm that allowed the efficient running of the business: agriculture needed direct mobile access to (human) labour and energy. This model, and the expectation that agriculture would continue to be the principal industry in rural areas, was constantly returned to in policy-makers', agricultural organisations' and commentators' discussions of whatever was determined to be an improvement of or desirable for the agricultural sector throughout our period. Both those writing for the farmer and those writing in support of the labourer, for example, in the interwar period believed that to return agriculture to the pre-eminent position that it had enjoyed during the period of 'High Farming', before the 1870s-80s 'Agricultural Depression', it was essential to keep the

labourer on the land. By the end of the 1940s the problem had been recast: securing sufficient labour came to be represented as being essential to reaching ‘maximum production’, and to depend on improved amenity in the labourer’s home. As well as building new homes, the standard of existing cottages had to be improved. ‘Water supply, improved sanitation, gas, electricity, and transport facilities’, the Royal Agricultural Society of England stated, ‘should be extended throughout rural districts’.^{xxviii} Improvements in amenity meant specific forms of energy (gas, electric and whatever powered ‘transport’) became essential, improving commodities. These would make the farm labourer’s home as desirable as that of ‘his’ urban counterpart. Electricity, gas, petrol and diesel, consumed by the labourer at home, therefore became key to successful farming.

The persistent link in twentieth-century agricultural discourse between labour, production, energy and farm was never clearer than when ‘Tied Cottages’, were being discussed. Tied Cottages, which dominated the rural housing debate at the time, were ‘houses provided by the farmer as part of an agricultural worker’s terms of employment’ as outlined by Howard Newby in a sociological study reflecting on reforms taking place in 1977. After the Second World War, though two thirds of farmers waived the payment associated with these cottages, they had every right in law to claw back some of the labourer’s wages as rent at a rate determined by the Agricultural Wages Act (1948). In this system, despite minor amendments, loss of employment normally resulted in loss of housing a month later, and this also affected ‘his’ dependents and widow if he passed away (UK law assumed a male agricultural labourer). As Newby noted, the Tied Cottage was contentious, but it was founded on the historical assumption that it was necessary for the labourer to be close to work, especially when that work involved livestock, and grew out of the Victorian model of agricultural improvement that ensured a constant access to labour. Indeed, the labourers’ cottages that had been built on model farms in the nineteenth century were called ‘tied’ to distinguish them from the ‘open’ cottages rented from those other than the employer (rural landlords great or small). ‘Thus’ Newby observed, ‘the tied cottage system emerged directly from the desire of farmers to control the labour supply’.^{xxix} For ‘labour’ read ‘energy’. However, energy consumption in the home was as heterogeneous as it was in the farm buildings and yard and an assessment of the consumption of energy in the country within the context of the labourer’s cottage and the farmhouse, as framed by the old model of an integrated farm, demonstrates that there were multiple rural ‘modernities’ 1920-1960. Some of these continued a much older, established culture of re-use.

Looking at the ledgers and cash books of hardware stores in local towns, we get a sense of the costs involved. Based in Selby, with references in its cashbooks to wages paid at the Ousegate Works, John H. Tyson's Ironmongers, for example, was a concern that provided services to business and private customers in a thriving centre connected with mining and shipbuilding, agriculture and a complex rural economy. There are records for the costs of laying water pipes, the cost of hay racks, and of making and repairing iron hurdles, harrows, ploughs and gates, and references to certificates awarded at a ploughing match. Together these represent the ebb and flow of energy and goods, and interconnection of services within the local rural economy, over decades. Tyson's records therefore provide us with a particularly valuable insight into something as commonplace as the 'cost of fitting New Ell Boiler in Kitchen Range' in 1894, which was £2.15.-, including the price of 'examining range £-.12 ½', as compared to the 'Cost of New Range Fixing at Mr Armstrong's' at a price of £10.16.. It was evidently cheaper to adapt an existing range than to install a new model. With something as large as a range, this is not surprising. However, within another Tyson's cashbook we see the sale of paraffin and petrol in 1898, a 'tin kettle' and a 'table lamp' in 1900, and the 'burner for petroleum stove; repaired and filled with new wick' in 1904, which tells us which forms of energy were in common use (coal, lamp oil, and petroleum), that it was worth the energy of repairing and maintaining a 'petroleum stove', and that it was a commonplace necessity to invest occasionally in smaller (additional or replacement) items.^{xxx} Things mended, and adapted through tinkering, linked to energy-efficient serviceable utility; dated stuff as well as new-fangled things lived alongside each other and used multiple energies within the space of the home.

The cottage, farm and farmhouse tapped into a range of pre-existing energy networks and, 1920-1960, very competitive power sources. Leaving aside paraffin, which Pathe likens to the technology of George IV, there was the new bottled gas manufactured and distributed by Calor from 1935 and new forms of solid-fuel-using stoves. Each fuel had its own modern sales pitch, and the two aspects combined in the farmhouse, at the time still an integral component of the farm where farm operations such as book-keeping took place, if nothing else. After the War, ideas of efficiency/speed, cleanliness, labour-saving etc. were writ large across all forms of technology available to the farming household, as can be seen in adverts for Rayburn and other up-to-date solid-fuel ranges in the 1950s,^{xxxi} and the differences between the old and new domestic technologies were well-known. A 1961 survey questionnaire formulated by the Joseph Rowntree Memorial Trust with the University of

Exeter, for example, aimed to determine in 1961 whether or not a householder had to use black lead where they had a cooker that ‘consumes solid fuel’ because the investigators sought to ‘distinguish between old-fashioned ranges and modern devices such as Rayburns’.^{xxxii} Though the alternatives to electricity therefore did not match up well to reformers’ and publicists’ rhetoric, which caste the *countryman* in the role of languishing behind *his* urban counterparts, this merely demonstrates that electricity was a marker of modernity, not that the countryside had in fact failed in its entirety to ‘progress’.

Structure and infrastructure

Its supporters believed that electricity was the power source best fitted to meet the new demands of the large-scale, commercial and specialist farming favoured by post-WWII policy-making, such as that directed within the provisions of the Agriculture Act (1947) informed by the United Nations’ conference on ‘freedom from want’ at Hot Springs in 1943. Electricity was conceived in and of itself as a ‘modern’ energy, and it underpinned ‘modern’ elements of farming that were sometimes quite subtle. Electric lighting, for example, supported techniques of accounting and book keeping that focused on improving farm production and efficiency. It became so entangled with modernity that in representations of these techniques it might simply be inferred to be present, without proof. One Second World War photograph (now held by the Imperial War Museum), for instance, shows a woman pouring over some neat and very well-lit farm accounts with the original caption ‘‘If she is not worth her feed, she will have to go’’.^{xxxiii} The light (by implication electric, given its brilliance) and the paperwork together generate an ideal of effective, technologically modern wartime farm production thanks to the photographer’s lighting equipment.^{xxxiv}

Subtler still, was the use of electricity within contexts that were quite new: while tractors powered by electricity did not catch on, electrical engineering skills certainly became part and parcel of running tractors – as these came to be adopted, so agricultural engineers (and farmers) were trained to maintain them. The same can be observed of automated battery lines, and in the end, the right kind of light needed to stimulate egg production and to keep the hens calm, to hatch eggs and warm chicks at brood farms, or to candle, grade and pack the eggs at packing stations.^{xxxv} new skills and new jobs emerged with new ways to consume energy. So, from this it was in the adoption of the entirely new technologies and modes of production favoured after the War that electricity finally caught hold in the countryside. This shift in consumption was linked by the proponents of agricultural progress to the emergence of a paradigmatic shift in farming that broke the existing spatial model of (human and animal)

energy consumption centred on the (mixed) farmstead. Less dependent on local energies (immediate human and animal labour) farm production was re-formed, remapped into specialised units that depended on connecting materially via power lines, transformers, pylons, and new road haulage networks into a much bigger energy grid centred on national distribution of its materials and products.

That is not a linear story, however, British agriculture had depended for a long time on stock driven by foot and carted to and from market, animal feeds brought in by shipping, rail and cart, (in many regions) on seasonal and agricultural gang labourers who did not live in tied housing,^{xxxvi} on expertise that circulated internationally. Animal husbandry had already demanded working with animals lit at in the dark hours before dawn at the start of the working day. Equally, though flock numbers were highest on electrically-powered battery farms, the large-scale batteries of the 1970s were outnumbered by mixed, family farms that still drew on local labour and relied on their generator in a power cut. Diesel in trucks, tractors and combines was as crucial an energy as electricity for rural modernity. The farm as a system is and was of necessity integrated historically into the energy flows of the local community, the national and the wider world. Farmers who had their own established practices and had made their investment had to be persuaded that electricity from the grid was reliable as well as efficient when other forms of power were available. Only when mains electricity had proven its worth and became fitted to the needs of agriculture was it consumed on farms. Farms were gradually added to the grid throughout this period (253,100 farms were connected to mains electricity supplies by 1963, in contrast to 151 in 1920, or 47,089 in 1940).^{xxxvii} But, the work for which it was best suited was work that did not involve mobility, tasks such as plugging lights into automated timed systems to stimulate laying hens. In other cases, as Cameron Brown had predicted, and was still being advocated in 1961 (along with the use of wind or hydro-generated independent supplies in remote areas),^{xxxviii} it required the farmer to adjust their practices: lighting the milking parlour and hooking the cattle up to electrically-powered milking machines was less of a leap for a farmer who had already started to bring his or her cattle into a permanent bail, but more of a stretch for the farmer who had not yet invested in a modern cow house, until forced by new hygiene regulations to follow suite.

Conclusion

In part, electrification allowed/facilitated mechanisation, and the desired efficiency gains after the War, in that much mechanisation was powered by electrification. But, there is more

to it than this. Other ‘modern’ energies (paraffin and bottled Calor gas) continued to compete successfully in rural areas, with unreliable, immobile and pricy coal-generated mains electricity, until at least the 1970s. Before 1970, conservationist responses to post war modernity in agricultural production, mourning the ‘death of the cottage’^{xxxix} were already generating petitions. The supposed simplicity of peasant life seen at a distance after the war fitted uncomfortably with the new agenda of reconstruction for increased food production, and the apparent adoption of ‘modern’ technology and materials, which therefore had to be reworked through guidelines, regulation and law: preservation became the order of the day and generated its own one-dimensional narrative of sweeping change (in this case, as a ‘bad thing’). A generation later, electric light alone had come to be identified with the penetrating and despoiling forces of the city, worked up by bodies such as The Council for the Protection of Rural England, in conjunction with the British Astronomical Association (1994), as allowing no visual peace to the country. As a code for ‘modernity’ and for capital, electric light (its presence/absence) had come, by the end of the twentieth century, to simultaneously define the supposed difference of rural/urban space and to link visibly the country to the city. These types of narrative, along with progressivist post-war policy making, have shaped the narrative of rural energy consumption to date. Yet, we know that the countryside was multiple, made up of many contingent countryside(s).^{xl} Rural energy consumption, rather being driven ‘forward’ by simple ‘efficiency’, the epitome of linear ‘progress’, was shaped by the region to which a cottage or a farm belonged, its livestock, the availability of ‘manpower’, access to services, access to retail sites, spending power and more. Just as there were many countryside(s), so there were multiple rural ‘modernities’ 1920-1960.

ⁱ Henry Bamford, ‘Motive Power in Agriculture’ entry in (ed.) R. Patrick Wright, *The Standard Cyclopaedia of Modern Agriculture and Rural Economy*, Vol. 9 (London: The Gresham Publishing Co., 1909) E:text available online at <https://archive.org/stream/in.ernet.dli.2015.109083/2015.109083.The-Standard-Cyclopedia-Of-Modern-Agriculture-And-Rural-Economy-Vol-9> (last accessed 22nd May 2017), p. 56

ⁱⁱ Marie Hartley and Jane Ingilby, *Dales Memories*, (Lancaster: Dalesman Books, 1986), p. 70

ⁱⁱⁱ Hartley and Ingilby, *Dales*.

^{iv} Paul Brassley ‘Electrifying Farms in England’ in Paul Brassley, Jeremy Burchardt, and Karen Sayer (eds), *Transforming the Countryside the Electrification of Rural Britain*, (London & New York: Routledge, 2017)

^v Leslie Hannah, *Electricity before Nationalisation: A Study of the Development of the Electricity Supply Industry in Britain to 1948*, (London: Macmillan, 1979); Leslie Hannah, *Engineers, Managers and Politicians: The First Fifteen Years of Nationalised Electricity Supply in Britain* (London: Macmillan, 1982); B. Luckin, *Questions of Power: Electricity and Environment in Interwar Britain*, (Manchester: Manchester University Press, 1990); R. Millward, ‘Business and Government in Electricity Network Integration in Western Europe, c.1900-1950’, *Business History*, 48, no. 4 (2006), pp.479-500; Richard Moore-Colyer, ‘Lighting the Landscape:

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- ^{xxiv} Irene Megginson, *Mud on My Doorstep: Reminiscences of a Yorkshire Farmwife*, (Hutton press, 1987), pp. 24, 31; Irene Megginson, 1919-2007, while growing up in Hull, had holidayed on the same farm in the 1930s, spent 18 months training and working as a groom in Devon after leaving school in 1937, and went home in the summer of 1939. While visiting the old family friends, war was declared and she stayed on as 'part of the workforce'. That 'workforce' included the family plus two 'lads' who lived in. Her obituary appeared in the *Yorkshire Post* on **Saturday 17 November 2007** <http://www.yorkshirepost.co.uk/news/community/obituaries/irene-megginson-1-2476337> accessed 12th June 2012
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- ^{xxxiii} B&W photograph, Imperial War Museum, 'A worker at Old Parsonage Farm [Devon], possibly the farmer's wife, Mrs Crook, checks the paperwork which lists the milk yield for every cow on the farm. The cows here are rationed according to the amount of milk they produce, and as stated in the original caption 'If she is not worth her feed, she will have to go'.' Catalogue number D 10232; Part of Ministry of Information Second World War Official Collection, Ministry of Information Photo Division Photographer.
- ^{xxxiv} Calor gas spotlights can produce 500-600 lumens, as compared to a 40-watt incandescent electric light bulb which produces 450 lumens, a 60 watt bulb 800 lumens.
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- ^{xl} Doreen Massey, *Space, Place and Gender* (Cambridge: Polity, 1994); Doreen Massey, 'Places and Their Pasts', in *History Workshop Journal*, no. 39, (Spring 1995); Paul Cloke and Jo Little (eds), *Contested Countryside Cultures: Otherness, Marginalisation and Rurality*, (London & New York: Routledge, 1997)